

SHORELINE NARRATIVE FOR ISSAQUAH SCHOOL DISTRICT HOLLY STREET CREEK BANK REPAIR

Introduction

The following narrative is intended to accompany the Shoreline Substantial Development Permit submittal for the Holly Street Creek Bank Repair project on Issaquah Creek. It describes the site, proposed bank stabilization measures, and regulatory setting for this project.

Site Description

The subject site is a 19.31-acre parcel located at 565 Northwest Holly Street, in the city of Issaquah, Washington. The parcel number for the site is 282406-9012 and it is within a portion of Section 28, Township 24N, Range 6E, W.M. Two access points to the subject site exist. One is located along the western property line along Newport Way Northwest and the second is located along the northern property line along Northwest Holly Street.

Topography on the site is relatively flat with a slight slope to the east toward Issaquah Creek. The majority of the property is developed with buildings and fields and has limited native vegetation. However, a few portions of the site contain forested areas with shrubs and groundcover in the understory. The forested areas along the northern and eastern edges of the property are primarily vegetated with native species, with some Himalayan blackberry and other invasive species along the eastern side of the property. Confluence Park is located to the east of the subject site.

Surrounding land use consists primarily of high-density single and multi-family residential development. This site is currently developed with Issaquah Valley Elementary School in the western portion, Dodd Fields Park in the south-central portion, and an Issaquah School District administration building in the eastern portion. Issaquah Creek is located along the eastern property boundary. The on-site shoreline designation associated with Issaquah Creek is Issaquah Creek Urban Conservancy Shoreline Environment. The FEMA preliminary 100-year floodplain and preliminary floodway of Issaquah Creek are mapped along the eastern property line, extending onto the subject site (King County iMap). Work will take place within the 100-year floodplain and a small portion of the project will take place within the mapped floodway.

Project Description

During the winter of 2019-2020, during periods of unusually heavy, prolonged rain, Issaquah Creek experienced extensive erosion of its west bank along the eastern boundary of the subject site.

An initial geotechnical assessment performed by Associated Earth Sciences, Inc. (*Geotechnical Design Recommendations – Issaquah Creek Bank Erosion Repair*, dated July 9, 2020) determined that unless stabilized, the channel erosion would continue to encroach into the District's property. Further erosion would cause damage to existing infrastructure and posed a safety hazard. A temporary emergency bank stabilization measure was installed to prevent damage to existing infrastructure on the site and ensure safety. The temporary stabilization was installed in March 2021. In order to avoid further erosion of the creek bank, the temporary stabilization will be removed as part of the construction of the permanent stabilization project. The current proposed project is for installation of more comprehensive, permanent stabilization measures consistent with

bioengineering techniques required by multiple agencies and the City of Issaquah.

The permanent stabilization project will consist of installing streambank protection along approximately 130 feet of cutbank on the west side of Issaquah Creek. Protection will include reconstruction of a portion of the bank lost to channel erosion in proximity to Issaquah School District infrastructure with an engineered, non-deformable ‘log toe’ incorporating large woody debris and habitat boulders. The log toe will provide protection against the erosive forces directed toward the bank, and provide habitat as stream-carried debris is caught and incorporated into the bank. Mechanical anchors are included in the design to add additional security for the large woody debris into the undisturbed streambank and channel, although habitat boulders will anchor the debris for normal and moderately-high flow flood stages of the stream. The woody debris will be situated such that the future possible effects of channel scour are mitigated as much as four feet below the existing channel bottom. As the bioengineered structure decays, revegetation within the reconstructed bank will take hold and form permanent, long-term stabilization.

Construction of the stream bank stabilization measures will include work within the ordinary high-water mark of Issaquah Creek. To facilitate work within the stream buffer and reduce impacts associated with construction, fish will be removed from the work area and a temporary coffer dam will be installed along the perimeter to isolate the work area for the duration of construction. All in-water work will be performed between July 1st and August 30th, the approved fish window.

Issaquah School District will also obtain the necessary permits from Washington state and Federal agencies.

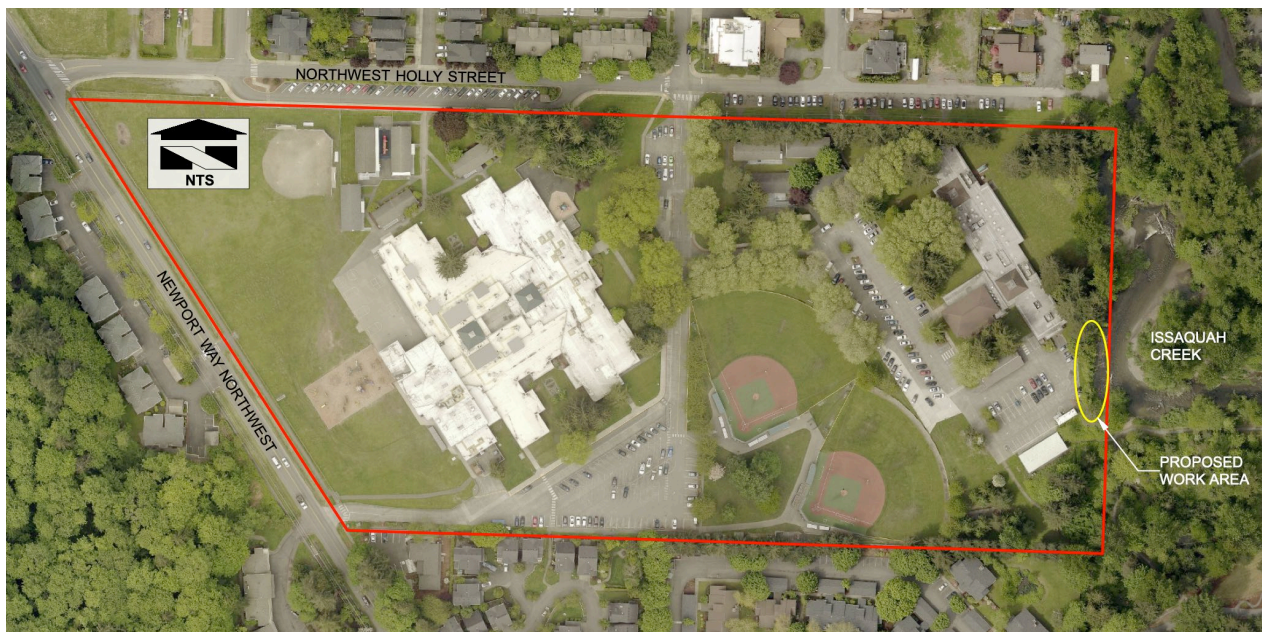


Figure 1: Aerial view of subject property and proposed work area.

City of Issaquah Shoreline Master Program

The City of Issaquah's Shoreline Management Program (SMP) contains a number of different allowed uses and activities along with policies and regulations for each. Since the primary use of the proposed project within the shoreline environment is bank stabilization, the Shoreline Stabilization section of the City's SMP applies.

The following will be addressed in this narrative followed by a conclusion section.

- Shoreline Stabilization Policies (5.12.1)
- Shoreline Stabilization Regulations (6.1.4)
- Shoreline Modification Regulations (7.1.3)

These three SMP elements are discussed below.

Chapter 5.12 Shoreline Stabilization

5.12.1 Policies

1. The use of hard structural shoreline stabilization measures such as concrete bulkheads should be minimized to reduce ecological impacts. Soft shore stabilization measures, appropriate building setbacks, drainage improvements, and/or beach enhancement are the preferred means of accomplishing stabilization objectives, unless these alternatives are demonstrated to be infeasible and hard structural stabilization is necessary to protect existing structures.

The proposed bank stabilization design incorporates habitat boulders, large woody debris, and native vegetation plantings. This design provides the necessary structural stabilization while also providing fish habitat.

2. Proposals for shoreline stabilization should assure no net loss of ecological functions and should minimize impacts on adjacent properties, including impacts to off-site erosion, accretion, and flood damage.

Temporary stabilization measures consisting of steel sheets and cobble filled super sacks are currently in place. These temporary measures are not designed to provide long-term stabilization as they are not set deep enough to provide protection from scour along the toe of the eroded bank. These temporary measures do not provide or enhance fish habitat. The proposed permanent bank stabilization includes rounded habitat boulders, large pieces of wood (including rootballs), and native vegetation plantings along the edge of Issaquah Creek. The proposed stabilization project will enhance the terrestrial habitat through removal of invasive species and installation of native plants. Existing fish habitat will be enhanced through installation of large woody debris within the channel.

The USACE Hydrologic Engineering Center's River Analysis System (HEC-RAS) was used to calculate flow and analyze sediment transport models. Based on this analysis, the proposed project will not have substantial impacts on adjacent properties. Please refer to the *Geotechnical and Engineering Geologic Hazard Evaluation*, by Nelson Geotechnical Associates, Inc. for details of this analysis.

3. Proposals to repair existing shoreline stabilization structures should include measures to enhance existing conditions for fish and wildlife, water quality, water flow, and sediment transport.

While this project is not a repair, the restoration plantings, large woody debris and rounded boulders will provide elements that will enhance the existing habitat conditions in the project area.

4. The City should expedite approval of development projects that remove or soften bulkheads or bank armoring and revegetate the shoreline.

Not applicable.

5. All shoreline uses and developments should be located and designed to prevent or minimize the need for shoreline protection structures (bulkheads, riprap, etc.) and stabilization, landfills, groins, jetties or substantial site grading. The City should not allow new uses, the creation of new lots or the construction of new development where it would be reasonably foreseeable that the development or use would further limit channel migration or require structural bank stabilization.

The proposed stabilization project is necessary to protect existing infrastructure on the Issaquah School District's property. After installation, the administration building will continue to be used in the same manner as before. No change of site use or creation of new lots is proposed.

6.1.4 Shoreline Stabilization Regulations

Shoreline Stabilization

1. Bioengineered shoreline stabilization (also known as bio-stabilization) is the preferred method for stabilizing shorelines and must be considered prior to hard structural stabilization measures.

The proposed bank stabilization combines bioengineered and structural components. This design will provide long-term stabilization of the stream bank and incorporates elements that will provide fish habitat.

Construction Standards for Shoreline Stabilization Structures

11. When allowed pursuant to the provisions of this Program, structural shoreline stabilization must meet all of the following requirements:

a. The length of hard structural shoreline stabilization structures shall be minimized to the extent feasible. It shall be limited to the portion of a site where necessary to protect the primary structure/use and/or to connect to existing hard structural shoreline stabilization structures on adjacent properties.

Issaquah Creek makes a 90-degree turn upstream of the project area, flows toward the District's property, and then makes another sharp turn to flow north away from the project area. Nelson Geotechnical Associates, Inc. conducted a scour analysis and utilized the Hydrologic Engineering Center's River Analysis System as part of the assessment to guide the design of the bank stabilization. The length of the stabilization measures is the minimum necessary to provide long-term protection against further erosion.

b. For replacement, expansion or repair of hard structural shoreline stabilization structures, excavation and fill activities shall be conducted landward of the existing OHWM, except when not feasible due to site conditions, or for the enhancement of shallow water habitat with gravel, logs or rock.

The storm events during the winter of 2019-2020 eroded away the area of stream bank between Issaquah Creek and the existing parking lot. The current OHWM is 10 to 40 feet from the previously surveyed OHWM, and is only about 7 feet from the edge of the parking lot. Per the geotechnical evaluation, this is not enough space to provide stabilization measures that account of the scour at the toe of the bank or velocity of water along the meander.

c. Short-term construction activities shall minimize and mitigate adverse impacts to ecological functions use of best management practices to prevent water quality impacts related to upland or in-water work, following seasonal timing restrictions, and stabilizing soils following construction.

All in-stream work will occur between July 1 and August 31, the approved work window for Issaquah Creek. The project will adhere to the Temporary Erosion and Sediment Control measures shown on the site plans. A temporary cofferdam will be installed (5' from the repair toe) which will isolate the work area. Straw wattles will be used to stabilize the exposed soils within the limits of disturbance. A temporary sediment trap will be located at the low-point behind the temporary cofferdam and all collected water will be pumped to a sediment tank. This will be used to treat surface water prior to releasing back into the creek. Turbidity will be monitored downstream of the project area during construction. After construction is completed, enhancement plantings will be installed in the area adjacent to Issaquah Creek.

12. Bulkheads and other similar hard stabilization structures shall be located so as to tie in flush with existing bulkheads on adjoining properties, except in instances where the adjoining bulkheads do not comply with the design or location requirements set forth in this Program.

Not applicable.

13. Shoreline stabilization shall be designed and constructed with gravel backfill and weep holes so that natural downward movement of surface or ground water may continue without ponding or saturation.

The stabilization measures proposed include jute soil bags and cobble, which will allow for natural movement of water through the constructed bank protection.

14. Stairs or other permitted pedestrian access structures may be built into a bulkhead but shall not extend waterward of it.

Not applicable.

15. Gabions shall not be used to stabilize shorelines because of their limited durability and the potential hazard to shoreline users and the shoreline environment.

No gabions are proposed.

16. No motor vehicles, appliances, similar structures nor parts thereof, nor structure demolition debris, nor any other solid waste shall be used for shoreline stabilization.

No solid waste or other debris listed above will be incorporated into the stabilization measures.

7.1.3 Shoreline Modification Regulations

New Shoreline Stabilization and Flood Control Structures

1. Bioengineered shoreline stabilization (also known as bio-stabilization) is the preferred method for stabilizing shorelines and shall be permitted.

The proposed bank stabilization design incorporates habitat boulders, large woody debris, and native vegetation plantings. This design provides the necessary structural stabilization while also providing important features for fish habitat.

2. New, expanded, or replaced bank stabilization or flood control structures may be allowed when:

a. Part of an approved project whose primary purpose is remediating hazardous substances pursuant to RCW 70.105, or

b. There is conclusive evidence, documented by a geotechnical analysis and reaffirmed by a peer review that a primary structure is in danger of shoreline erosion caused by currents or waves and not caused by normal sloughing, vegetation removal, or poor drainage.

The cause of the erosion was several storm events during the winter of 2019-2020. Nelson Geotechnical Associates, Inc. prepared a *Geotechnical and Engineering Geologic Hazard Evaluation* report for this streambank stabilization project which discusses the cause of erosion and potential future issues.

3. New stream bank stabilization structures shall incorporate features that minimize adverse effects on riparian habitat, salmon spawning and migration, and water quality. Such features shall include native vegetation, large wood, rocks, and other techniques that have been shown mitigate the effects of bank armoring on stream ecology. The City shall approve approaches consistent with Washington Department of Fish and Wildlife bank stabilization guidelines.

The proposed design incorporates restoration plantings, large woody debris and rounded boulders. These elements will provide habitat and minimize effects of the stabilization measures.

Information Required for New Shoreline Stabilization and Flood Control Structures

4. In assessing compliance with the provisions of this section, the Planning Director/Manager shall require the applicant or project sponsor to provide a geotechnical analysis that:

a. Describe existing topography, existing development; and location of abutting bulkheads; and

b. Evaluate the need for structural shoreline stabilization and potential impacts to habitat and other ecological functions, and;

c. Describe alternatives to structural approaches including increasing building setbacks and shoreline buffers and vegetative stabilization.

Nelson Geotechnical Associates, Inc. has prepared a *Geotechnical and Engineering Geologic Hazard Evaluation* report for this project. This report includes the information listed above. Additionally, the *Critical Area Study and Buffer Mitigation Plan* prepared by Wetland Resources, Inc. (WRI) contains an assessment of ecological functions and values. An effects analysis on habitat is included in the *Floodplain Habitat Assessment* prepared by WRI.

5. Technical reports shall be prepared by a Washington State licensed engineer and/or licensed geologist or engineering geologist and may include a qualified biologist as appropriate. The reports shall be peer reviewed and meet the application requirements of IMC 18.10 and all other procedures for land use permit applications and public notice. Geotechnical analysis required pursuant to this section shall address the necessity for shoreline stabilization by estimating time frames and rates of erosion and report on the urgency associated with the specific situation. Hard armoring shall not be authorized unless the report confirms that there is a significant possibility that such a structure will be damaged within three (3) years as a result of shoreline erosion in the absence of such hard armoring measures, or where waiting until the need is that immediate, would foreclose the opportunity to use measures that avoid impacts on ecological functions.

Reports prepared for the project include:

Geotechnical and Engineering Geologic Hazard Evaluation, by Nelson Geotechnical Associates, Inc.

Floodplain Habitat Assessment, prepared by WRI

Critical Area Study and Buffer Mitigation Plan prepared by WRI

Construction Standards for New Shoreline Stabilization and Flood Control Structures

10. New shoreline stabilization or flood control structures shall be placed landward of the floodway as established in Federal Emergency Management Agency (FEMA) flood insurance rate maps or floodway maps.

All the proposed cobble, jute soil bags, and anchors for the bank stabilization will be located outside of the floodway. A few of the rootwads of the large woody debris and anchor boulders may extend into the floodway depending on the exact size of the trees acquired for the project.

11. New shoreline stabilization or flood control structures shall be placed landward of associated wetlands, and designated vegetation conservation areas, except when the project includes increasing ecological functions as part of the design or as mitigation for impacts.

The proposed project will not impact any wetlands or vegetation conservation areas.

12. New, expanded, replaced, or repaired shoreline stabilization or flood control structures shall be planted with vegetation suitable for wildlife habitat.

Two areas of buffer restoration are proposed as part of this project, including a portion of the proposed stabilization measures. Details of the Buffer Restoration Planting Plan is included in *Critical Area Study and Buffer Mitigation Plan* prepared by WRI.